What we claim is:

1. A noise canceling method comprising the steps of:

interpolating a noise component based on a signal in which a time, an amplitude, and a phase are specified which is included into a received signal, and

canceling the noise component from the received signal.

2. A noise canceling method comprising the steps of:

periodically inserting a zero-point into a signal on a transmission side,

interpolating a noise component by using the zero-point on a reception side, and

subtracting the noise component from a received signal.

3. The noise canceling method as claimed in claim 2 wherein one or more zero-points are inserted at intervals of an integer number of samples.

4. The noise canceling method as claimed in claim 3 wherein an inserted number of the zero-points is determined by deciding a signal quality on the reception side to be notified to the transmission side.

5. The noise canceling method as claimed in any one of claims 1 to 4 wherein a transmission line of the received signal comprises a transparent transmission line.

6. The noise canceling method as claimed in claim 5 wherein the transparent transmission line comprises a Nyquist transmission line.

7. The noise canceling method as claimed in claim 1 or 2 wherein the step of interpolating includes steps of performing a frequency shift of the received signal to a desired frequency bandwidth, decimating according to the zero-point, performing an interpolation, and finally performing the frequency shift in a reverse direction so as to adjust to the original signal, thereby generating the noise component of the received signal.

8. The noise canceling method as claimed in claim 7 wherein for the

step of interpolating, a zero-point is inserted into the decimated signal, and a low-pass filter process for making an interpolation bandwidth a transmission bandwidth is further performed.

9. The noise canceling method as claimed in claim 8 wherein the low-pass filter process comprises a cos-squared filter process for making the interpolation bandwidth a Nyquist bandwidth.

10. The noise canceling method as claimed in claim 8 wherein the low-pass filter process comprises a cos filter process for making the interpolation bandwidth a Nyquist bandwidth.

11. The noise canceling method as claimed in claim 7 wherein a frequency bandwidth, in which a noise frequency component is large, is detected in the received signal so that the frequency shift amount is automatically determined for the frequency bandwidth.

12. The noise canceling method as claimed in any one of claims 1 to 11 wherein an automatic equalizing process is further performed so as to remove an intersymbol interference at a former or latter stage of a noise cancelation.

13. A noise canceling apparatus comprising:

means for interpolating a noise component from a received signal including a signal in which a time, an amplitude, and a phase are specified, and

means for canceling the noise component from the received signal.

14. A noise canceling apparatus comprising:

means for periodically inserting a zero-point into a signal on a transmission side,

means for interpolating a noise component of a received signal by using the zero-point on a reception side, and

means for subtracting the noise component from the received signal.

15. The noise canceling apparatus as claimed in claim 14 wherein one

or more zero-points are inserted at intervals of an integer number of samples.

16. The noise canceling apparatus as claimed in claim 15 wherein an inserted number of the zero-points is determined by deciding a signal quality on the reception side to be notified to the transmission side.

17. The noise canceling apparatus as claimed in any one of claims 13 to 16 wherein a transmission line of the received signal comprises a transparent transmission line.

18. The noise canceling apparatus as claimed in claim 17 wherein the transparent transmission line comprises a Nyquist transmission line.

19. The noise canceling apparatus as claimed in claim 13 or 14 wherein the means for interpolating include means for performing a frequency shift to the received signal to a desired frequency bandwidth, means for decimating according to the zero-point thereafter, means for further performing an interpolation, and means for performing the frequency shift in a reverse direction so as to adjust to the original signal, thereby generating the noise component of the received signal.

20. The noise canceling apparatus as claimed in claim 19 wherein the interpolation means include a circuit for inserting zero-points into the decimated signal, and further include a low-pass filter for making an interpolation bandwidth a transmission bandwidth.

21. The noise canceling apparatus as claimed in claim 20 wherein the low-pass filter comprises a cos-squared filter for making the interpolation bandwidth a Nyquist bandwidth.

22. The noise canceling apparatus as claimed in claim 20 wherein the low-pass filter comprises a cos filter for making the interpolation bandwidth a Nyquist bandwidth.

23. The noise canceling apparatus as claimed in claim 19 wherein the means for performing the frequency shift include means for detecting a frequency bandwidth, in which a noise frequency component is large, in the received signal so that the frequency shift amount is

automatically determined for the frequency bandwidth.

24. The noise canceling apparatus as claimed in any one of claims 1 to 23 wherein an automatic equalizer is further provided for removing an intersymbol interference at a former or latter stage of a noise cancelation.